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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MYERS DAWES ANDRAS & SHERMAN, LLP
19900 MACARTHUR BLVD.,
SUITE 1150
IRVINE, CA 92612

EXAMINER	
LUU, THANH X	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 10/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,242	SCHERER ET AL.	
	Examiner	Art Unit	
	Thanh X. Luu	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30 and 33-62* is/are rejected.

7)☒ Claim(s) *31,32,63 and 64* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: The reference numbers referred to in the specification regarding Fig. 8 is not found in the figure. The reference numbers "44", "46", "46a", "46b", "36" (with respect to Fig. 6), flow channel "28" is not found in the figures. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 15, 26, 27, 31, 41, 58, 59, rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 15, there are method steps in an apparatus claim.

Regarding claims 26, 27, 58 and 59, it is unclear how the substance is related to the analyte.

Regarding claim 31, "the read-out process" lacks proper antecedent basis.

Regarding claim 41, "each microresonator" lacks proper antecedent basis as there is only one microresonator claimed.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3-6, 11-13, 15, 18-20, 27, 29, 33, 35-38, 43-45, 50, 51, 59, 61, are rejected under 35 U.S.C. 102(e) as being anticipated by Tapalian et al. (U.S. Patent 6,657,731).

Regarding claims 1, 3-6, 11, 15, 18-20, 27, 29, 33, 35-38, 43-45, 50, 51, 59, 61, Tapalian et al. disclose (see Figs. 1 and 2) a microsensor and method for sensing a substance, comprising: a substrate (not shown); a source of light (15); an optical microresonator (12) fabricated in the substrate exposed to the substance to allow an interaction between the microresonator and the substance; a waveguide (18) coupling the source of light to the microresonator; and a detector (17) coupled to the microresonator to measure a performance parameter of the microresonator sensitive to

interaction of the substance with the microresonator. Tapalian et al. also disclose a ring microresonator (see paragraph [0023]); an initial Q of 10000 or greater (see paragraph [0025]); the performance parameter is the resonant frequency which represents an absorption loss of WGM (see paragraph [0033]); a plurality of microresonators and detectors (see Fig. 5) as claimed. The method of manufacturing adds no structural limitation to the claim. An addressing circuit is inherent since the detectors would have be accessed and readout.

6. Claims 1, 3-5, 11-13, 15, 18-20, 27, 29, 33, 35-38, 43-45, 50, 51, 59, 61, are rejected under 35 U.S.C. 102(e) as being anticipated by Lim et al. (U.S. Patent 6,661,938).

Regarding claims 1, 3-5, 11-13, 15, 18-20, 27, 29, 33, 35-38, 43-45, 50, 51, 59, 61, Lim et al. disclose (see Fig. 1) a microsensor and method for sensing a substance, comprising: a substrate (not shown); a source of light (106); an optical microresonator (104) fabricated in the substrate exposed to the substance to allow an interaction between the microresonator and the substance; a waveguide (102) coupling the source of light to the microresonator; and a detector (108) coupled to the microresonator to measure a performance parameter of the microresonator sensitive to interaction of the substance with the microresonator. Lim et al. also disclose a ring microresonator (see col. 2, line 60); an initial Q of 10000 or greater (see col. 3, line 33); the performance parameter is the resonant frequency (see Fig. 2); a plurality of microresonators and detectors (see col. 4, lines 5-10) as claimed. The method of manufacturing adds no structural limitation to the claim. An addressing circuit is inherent since the detectors

would have be accessed and readout.

7. Claims 1, 3, 18, 29, 33, 35, 38, 50 and 61, are rejected under 35 U.S.C. 102(e) as being anticipated by Boyd et al. (U.S. Patent Application Publication 2004/0023396).

Regarding claims 1, 3, 18-20, 29, 33, 35, 38, 50 and 61, Boyd et al. disclose (see Fig. 1) a microsensor and method for sensing a substance, comprising: a substrate (not shown; see paragraph [0021]); a source of light (16); an optical ring microresonator (12) fabricated in the substrate exposed to the substance to allow an interaction between the microresonator and the substance; a waveguide (14) coupling the source of light to the microresonator; and a detector (18) coupled to the microresonator to measure a performance parameter of the microresonator sensitive to interaction of the substance with the microresonator. Boyd et al. also disclose the performance parameter is an optical absorption loss (see paragraph [0054]) as claimed.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 30 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Tapalian et al., Lim et al. or Boyd et al.

Regarding claims 30 and 62, Tapalian et al., Lim et al. and Boyd et al. disclose the invention as set forth above. Tapalian et al., Lim et al. and Boyd et al. further disclose the source of light is a laser. Tapalian et al., Lim et al. and Boyd et al. do not

specifically disclose the type of laser as claimed. However, VCSELs are notoriously well known. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a VCSEL in the apparatus and method of Tapalian et al., Lim et al. or Boyd et al. to obtain compact and stable light source.

10. Claims 2, 20-25, 34, 52-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Tapalian et al. or Lim et al.

Regarding claims 2, 20-22, 34 and 52-54, Tapalian et al. and Lim et al. disclose the invention as set forth above. Tapalian et al. and Lim et al. also disclose the coating alters an optical parameter (refractive index) as claimed. Tapalian et al. and Lim et al. do not specifically disclose a polymer coating as claimed. However, it is well known that polymer coatings are reactive to certain gases or substances. Furthermore, choosing the type of coating requires only routine skill in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a polymer coating in the apparatus and method of Tapalian et al. or Lim et al. to detect a specific desired substance.

Regarding claims 23 and 55, Tapalian et al. and Lim et al. disclose the invention as set forth above. Tapalian et al. and Lim et al. do not specifically disclose using ELISA techniques as claimed. However, ELISA techniques are well known. Furthermore, choosing the type of coating requires only routine skill in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide use ELISA techniques in the apparatus and method of Tapalian et al. or Lim et al. to detect a specific desired substance.

Regarding claims 24, 25, 56 and 57, Tapalian et al. and Lim et al. disclose the invention as set forth above. Tapalian et al. and Lim et al. do not specifically disclose elastomeric coating or coating using a microfountain pen as claimed. However, elastomeric coating is well known. Furthermore, choosing the manner how the coating is applied requires only routine skill in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide use elastomeric techniques or a microfountain in the apparatus and method of Tapalian et al. or Lim et al. effectively and precisely apply the coating.

11. Claims 7, 16, 17, 39, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Tapalian et al. or Lim et al. in view of Hollis et al. (U.S. Patent 5,846,708).

Regarding claims 7 and 39, Tapalian et al. and Lim et al. disclose the invention as set forth above. Tapalian et al. and Lim et al. do not specifically disclose the performance parameter is the quality factor as claimed. Hollis et al. teach (see col. 2, line 55) that a change the quality factor provides the substance detection. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide examine the quality factor in the apparatus and method of Tapalian et al. or Lim et al. in view of Hollis et al. to further obtain the performance parameter.

Regarding claims 16, 17, 48 and 49, Tapalian et al. and Lim et al. disclose the invention as set forth above. Tapalian et al. and Lim et al. do not specifically disclose a microfluidic circuit as claimed. Hollis et al. teach (see Fig. 18) the claimed microfluidic

circuit. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide such a circuit in the apparatus and method of Tapalian et al. or Lim et al. in view of Hollis et al. to efficiently deliver the substance for detection.

12. Claims 10 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Tapalian et al. or Lim et al. in view of Iltchenko (U.S. Patent 6,798,947).

Regarding claims 10 and 42, Tapalian et al. and Lim et al. disclose the invention as set forth above. Tapalian et al. and Lim et al. do not specifically disclose a fiber and a grating coupler as claimed. Iltchenko teaches (see Fig. 8) the claimed fiber and grating coupler. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide such a read-out optic in the apparatus and method of Tapalian et al. or Lim et al. in view of Iltchenko to improve detection as taught.

13. Claims 8, 9, 14, 28, 40, 41, 46, 47 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Tapalian et al. or Lim et al. in view of Soref et al. (U.S. Patent 6,195,187).

Regarding claims 8, 9, 14, 28, 40, 41, 46, 47 and 60, Tapalian et al. and Lim et al. disclose the invention as set forth above. Tapalian et al. and Lim et al. do not specifically disclose a SOI substrate or a germanium detector as claimed. Soref et al. teach (see Figs) fabricating microresonators on an SOI substrate. Furthermore, germanium detectors are well known. Thus, it would have been obvious to a person of

ordinary skill in the art at the time the invention was made to provide an SOI substrate and a germanium detector in the apparatus and method of Tapalian et al. or Lim et al. in view of Iltchenko to obtain a desired wavelength response and to more easily incorporate the waveguide onto the substrate.

Allowable Subject Matter

14. Claims 31, 32, 63 and 64 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is 571-272-2441. The examiner can normally be reached on M-F 6:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thanh X Luu
Primary Examiner
Art Unit 2878

10/2005